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ECONOMIC INSTRUMENTS OF STRATEGIC HOUSEHOLD WASTE MANAGEMENT

Introduction. *The need to pursue more active government policy for the stimulation of waste processing is caused by the necessity to prevent those threats that arise unless an environment friendly and efficient waste management system is in place.*

Problem Statement. *Ukraine demonstrates a low level of household waste recycling, which poses a hazard to the environment, quality of life, and health of the population of Ukraine. The measures identified in the National Waste Management Strategy until 2030 can be implemented by combining the organization of separate collection of household waste with the revision of the existing incentives aiming at increasing the demand for secondary resources.*

Purpose. *The purpose of this research is to generalize the causes of low amount and rates of processing of household waste and to develop a system of economic tools for the formation of supply and demand for household waste as main factors of effective strategic waste management.*

Material and Methods. *Qualitative analysis and generalization of theoretical material, systematization of economic tools of household waste management, economic and statistical analysis, and regression analysis have been used in this research.*

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Results. *A set of tools for strategic household waste management and changes in approaches to their formation have been proposed. The formation of waste management tariff should be based on the length of the waste management chain, the structure of the collected waste, the potential for its recycling, the revised methods for forming the tariff, organizing waste sorting, and amending the list of tax payers of environmental tax.*

Conclusions. *The household waste management in Ukraine demonstrates certain stability of the waste processing structure and the absence of dynamic transformations in response to changes in the modern economy. It needs support, in particular, the revision of the set of economic tools for stimulating waste processing and organizational approaches to their implementation.*

Keywords: household waste, economic tools, waste management, waste management tariffs, and waste management costs.

In 2014, Ukraine signed the Association Agreement with the EU thereby undertaking to harmonize the national waste management system with the European waste regulations and to implement the European principles and mechanisms. In the European Union, the waste management is governed by Directive on Waste (Directive No. 2008/98/EC), Directive on the Landfill of Waste (Directive No. 1999/31/EC), and Directive on the Management of Waste from Extractive Industries (Directive No. 2006/21/EC). In order to implement the Association Agreement and, in particular, the EU Directives, the Cabinet of Ministers of Ukraine approved the National Waste Management Strategy in Ukraine until 2030, in 2017, and the National Waste Management Plan until 2030, in 2019. In accordance with this Strategy, Ukraine undertakes to raise the level of household waste processing; to ensure in 2023 the processing of 15 percent of household waste with the help of incentive tools; to increase the share of the population who sorts out household waste to 23 percent, and to put waste sorting lines and waste processing plants into operation; to ensure in 2030 the processing of 50 percent of the total amount of household waste generated due to increasing in the share of the population who sorts out household waste to 48 percent and launching additional waste sorting lines and waste processing plants; to build a network of garbage transfer stations (200 units) for reducing the general transport costs, etc. [1].

Pursuing more active government policy to stimulate waste processing is necessary not only for achieving strategic indicators, but also because of those irreversible environmental dangers that ap-

pear if no environment friendly and rational system of waste management is in place. After all, nitrogen oxide, carbon monoxide, heavy metals, and dioxin as one of the most dangerous compounds are released into the air as a result of waste incineration. Benzopyrene is released from smoldering leaves and haulm. In landfills where there is no proper waste management system, methane, carbon monoxide, ammonia, phenathrene, anthracene, and other elements are released into the atmosphere; leachate (wastewater) pollutes groundwater; greenhouse gases, carbon dioxide and methane, which are formed during anaerobic decomposition of waste pollute the Earth's atmosphere [2]. In the conditions of growing consumption of resources, the amount of waste increases, which negatively affects the quality of life of the population. In 2018, in EU countries, waste production (all economic activities and households) excluding major mineral waste reached 1,820 kg per capita [3]. In Ukraine, it came to 300 kg per capita [1], including 142.7 kg household waste [4].

Such a huge amount of waste determined the need to build a safe and efficient system of waste treatment.

The experience of building household waste management systems in some European countries has proven the potential for saving valuable resources in the processing of household waste, as well as the possibility of reducing capital and operational expenses for environmental protection.

The polluting effect of waste on the environment and human life depends on the two fundamental factors: 1) the amount of generated waste; 2) national waste management policy. In the con-

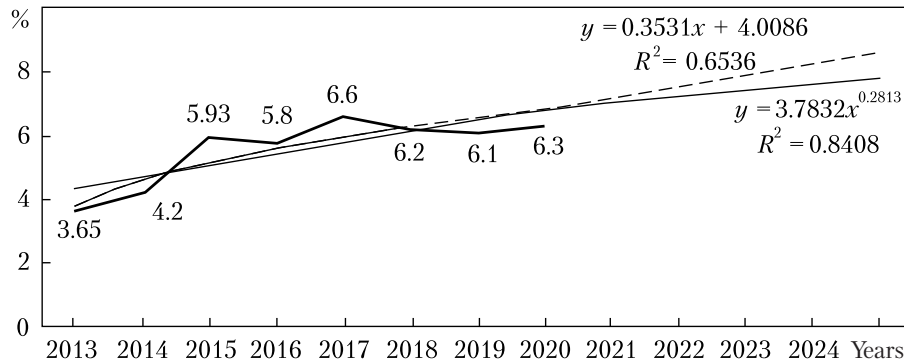


Fig. 1. The share of processed and disposed solid household waste, %

ditions of the modern economy, the amount of household waste generated has been directly correlating with the level of consumption, which depends on country's population income.

The national waste management policy is based on legal, organizational, economic, and information components of all processes of waste management. Despite the fact that the legal framework of the waste management system has been gradually amended towards implementing the European waste management standards into the national legislation, the state of household waste treatment in Ukraine does not allow achieving the strategic guidelines defined in the National Strategy.

It should be noted that these simplest functional dependencies are used for confirming the need to introduce economic tools to encourage intensifying activities in the field of household waste processing rather than for estimating predictive values.

In addition, based on the mentioned trend, it can be concluded that the achievement of the targets defined in the National Waste Management Strategy until 2030 is impossible unless innovative technologies are introduced in the field of waste management. The necessary and sufficient condition for an innovative breakthrough in the field of waste management is the revision of the existing incentives for waste processing.

The problem of household waste management is the subject of research in the field of economic, environmental, and legal sciences. This research is based on the methodological principles of ma-

agement, as developed by O. Samoilov [5]; strategic directions for the management of the solid waste management system, as proposed by Andrew Whiteman, Mike Webster, David C. Wilson [6], Michael Lugo, Snehes Shivananda Ail, Marco J. Castaldi [7]; economic tools of waste management, as described by Chiara Magrini, Filippo D'Addato, Alessandra Bonoli [8], Iman Ghalekhondabi, Reza Maihmi [9]; the formation of a balanced system of relationships among the members of the waste management system, as developed by Daker Taha Dib Elrabaya [10].

The purpose of this research is to generalize the causes of low amount and rates of household waste processing and to systematize the economic tools for forming the supply and demand for household waste as main factors of effective strategic management in the field of waste management.

Waste is generated in the process of economic activities of various economic entities, which determines the structural and technological diversity of ways of waste processing and treatment. Today, the problem of household waste management is becoming particularly urgent, since none of the countries in the world has formed a complete closed cycle of waste treatment. In the EU, the waste recycling ranges from 90% to 38%, the household waste recycling has grown over the past 18 years almost 1.9 times; the share of resource reuse has increased 1.8 times [11] (Table 1).

In Ukraine, the share of waste processed was 6.2% in 2018 versus 6.3% in 2020 [12]. This pro-

ves the lack of economic conditions for the implementation of the National Waste Management Strategy until 2030 and actualizes the need to monitor the waste management sphere, to analyze the causes of the lack of economic interest in the processing of household waste and, based on the results, to implement a set of economic tools for the formation of a balanced system of interests of all members of the waste management system (Table 2).

The lack of economic incentives for the implementation of waste treatment projects is the main cause of the low amount and rate of waste recycling

and the dominating trend of waste placement in landfills.

Each economic agent involved in economic relations in the waste management sphere realizes its social and economic interests (Table 3).

The different economic interests of the waste management chain members form a conflict of interests. A key to agreement is the tariff that is calculated by amalgamated territorial communities and takes into account the payment for services of storage, transportation, and placement of household waste in landfills.

Table 1. Production and Recycling of Household Waste in EU, million tons

Waste treatment type	Year						
	2000	2005	2010	2015	2016	2017	2018
Landfill	140	110	93	64	60	58	57
Incineration	39	48	57	65	68	70	70
Recycling	40	52	63	71	73	74	75
Composting	24	29	34	38	41	42	43
Other	12	17	6	6	6	6	6
Total	255	256	253	244	248	250	251
Share of recycled waste use %	15.7	20.3	24.9	29.1	29.4	29.9	29.9

Source: created by the authors on the basis of [11].

Table 2. Production and Treatment of Household Waste in Ukraine

Year	Household waste, million m ³	Recycling and disposal of household waste, %	Including, %	
			Incinerated	Arrived at waste collecting and processing (recycling) facilities
2013	59	3.65	1.15	2.5
2014	45 *	4.2	1.7	2.5
2015	48	5.93	2.73	3.2
2016	49	5.8	2.71	3.09
2017	52	6.6	2.48	4.18
2018	54	6.2	2	4.2
2019	53	6.1	2	4.1
2020	54	6.3	1.7	4.6

Source: HHW treatment and processing in Ukraine, in 2013–2020.

URL: <https://www.minregion.gov.ua/napryamki-diyalnosti/zhkh/terretory> (Last accessed: 10.10.2021).

The procedure for establishing tariffs for household waste management services, as approved by Resolution of the Cabinet of Ministers of Ukraine on July 26, 2006, obliges the communal enterprises to include in the tariff all types of services that are used for this type of waste. The tariff should be formed depending on the length of the waste management chain. The longer is the waste management chain, the higher should be the tariff. In the conditions of low purchasing power of the population of certain urban and rural communities, waste processing becomes economically unprofitable for local authorities, since it entails the need to increase the tariff. As a result, the population's due for housing and communal services grows. This situation partially explains the existence of unauthorized landfills, where the cost of waste disposal is 2–3 times lower than the cost of waste disposal at authorized landfills.

The costs of waste management shall include the costs of the entire length of the chain to cover the obligations of local authorities. The sale of waste releases the utility enterprises of local councils from the obligation to include the costs of the next stages of the chain in the waste management tariff. Revenues from such sales, excluding the sales costs and profit of the utility enterprise, shall result in reducing the tariff for subsequent periods.

Such pricing in the field of waste management: 1) is a way of implementing a floating tariff instead of a fixed one; 2) creates incentives for utility enterprises to intensify efforts in selling waste for the further processing; 3) reduces the load on landfills; 4) reduces the tariff and social tension in society.

The next problematic aspect of effective pricing, which requires an innovative solution, is the choice of pricing method: unification or differentiation. In the existing pricing of household waste management, today there is a differentiation of tariffs by categories of consumers (population, budget institutions and organizations, other consumers). With the adoption of Resolution of the Cabinet of Ministers of Ukraine dated March 27, 2019 No. 318 *Rules for the Provision of Services in the Field of Household Waste Management*, the following types of waste are distinguished: the large-sized waste (solid waste having dimensions over 50×50×50 cm, which cannot be placed in containers with a volume of up to 1.1 cubic meters; the repair waste (the remains of materials, objects, products, which are formed during capital repair, regular renovation, redevelopment, conversion, extension, etc., in a residential building, an individual apartment, or a public building).

So, on the basis of the above, it can be concluded that pricing for waste management services

Table 3. Social and Economic Goals of the Members of Waste Management Chain

Waste management chain member	Goals	
	Social	Economic
State/government	Ecological safety Quality of life of the population Fulfilling the requirements of the Association Agreement between Ukraine and the EU Achieving the targets of the Strategy	Increasing the share of waste processing Investment attractiveness of the field of waste management Balance of interests of the waste management chain members
Amalgamated territorial communities	Sanitary condition of the city Environmental safety	Local development
Municipal and private enterprises	Timeliness and quality of services provided	Increasing the service tariff Profitability
Consumers	Clean city	Decreasing the waste management tariff

Source: created by the authors on the basis of [1, 15].

has a unified character within the defined categories of consumers.

However, the morphological analysis of household waste determines its different structure and, accordingly, the potentially different length of the waste management chain.

The averaged structure of solid household waste in Ukraine is as follows: food remains (35–50%), paper and cardboard (10–15%), secondary polymers (9–13%), glass (8–10%), metal (2%), textiles (4–6 %), construction waste (5%), wood (1%), and other waste (10%) [13].

Based on the amount of household waste produced in Ukraine, in 2020, the quantitative indicators of the presented structure are shown in Table 4.

Some part of produced waste is not suitable for recycling due to its contamination and moisture content above permissible values. The modern methods used for the waste morphology do not take into account the above-mentioned fact and, thus, are misleading. The problems caused by the use of modern methods of waste morphology and potential financial losses due to the discrepancy between the results of the morphology and the actual indicators of the utilization of recycled materials have been identified in [14]. On the basis of experimental data, the author has proven that the recycling potential sharply decreases when household waste is mixed. The study has shown a 4-time drop in the revenues from the sale of secondary raw materials. The lost revenues of the waste sorting line by component are as follows: 99.3% for cardboard and paper, 94.7% for plastic containers, and 82.2% for glass.

Therefore, the tariff for household waste management services should take into account the morphology of waste, the quantity and quality of recyclable components.

The principle of balancing the economic interests of all members of the waste management chain in conditions of negative perception of a rise in the tariff in society should be implemented to find ways for reducing the costs. In particular, the transport component of the tariff for waste management accounts for 20–25%, the fee for the placement of solid waste makes up to 10% of the total tariff for the population. At the same time, the transport costs affect the tariff for all members of the waste management chain. Accordingly, decreasing the transport costs and the amount of waste disposed in landfills will allow reducing the tariff for waste management. The implementation of the specified direction of improvement of the pricing policy in the field of waste management is related to the method of organizing the collection, sorting, and processing of waste.

The combined waste processing enterprises, where sorting equipment, a waste processing plant, and a biogas plant are located in one place, allow reducing transport costs and achieving environmental and energy security of waste management.

The experience of European countries has proven the effectiveness of managing transport costs in forming the cost of waste management by applying the differentiation of transport tariffs for the removal of sorted and unsorted waste, where the tariff for the removal of unsorted waste is higher.

In addition to the transport costs, the formation of tariffs for waste management is influenced

Table 4. Amount of Household Waste in 2020

Year	Household waste	Including								
		Food remains	Paper and cardboard	Secondary polymers	Glass	Metals	Textile	Construction waste	Wood	Other
Structure, %	100	35	10	9	8	2	4	5	1	26
Amount, million m ³	54	18.9	5.4	4.86	4.32	1.08	2.16	2.7	0.54	14.04

Source: created by the authors on the basis of [12, 13].

by minimum wage, tariff rates and unit rates for wages, tax rates. Their growth leads to a corresponding increase in the tariffs.

In accordance with the Internal Revenues Code of Ukraine, the subject of waste disposal at landfills is the payer of environmental tax as a source of funds for reclamation and the entire complex of works at authorized landfills. The subject of waste disposal is communal enterprises that carry out waste removal to the landfill. However, in relation to the entities that produce potential amount of household waste, such communal enterprises are intermediaries who, on the basis of a contract with households, act as individual links of the household waste management chain. In addition, such enterprises affect neither the amount nor the structure of the generated waste.

This policy of environmental tax does not correspond to the European principles of waste management: “the polluter pays” and “extended producer responsibility.” Replacing the payer would reduce the tax burden on the subject of waste disposal, and, accordingly, reduce the tariff for the disposal of household waste for households.

Since the above-mentioned European principles transfer the responsibility for the amount of waste placed in landfills to the producer of a potential object of environmental pollution, then, accordingly, the subject of environmental tax should be waste producer (for example, manufacturers of containers and packaging) or importer of products, the consumption of which leads to the generation of waste. At the same time, environmental tax rates correlate with the structure of household waste placed in landfills and incinerated and the degree of risk of the associated environmental pollution.

Therefore, the imbalance of economic interests of economic entities in the field of waste management is the main cause of the lack of significant dynamic changes towards the increase in the share of recycled waste, and a real risk of failure to achieve the targets defined in the National Waste Management Strategy.

The main cause of the threatening imbalance is the lack of economic interest in the formation of

waste processing infrastructure among private investors. Thus, as of 2019, 34 waste sorting lines, 1 waste incineration plant and 3 waste incinerators were operating in Ukraine [12].

Today, the low amount of separately collected household waste (the facilities for separate collection have been available in as few as 1,462 settlements of Ukraine so far) results in its low supply to processing enterprises, and uncertainty in terms of reliability and stability of its supply. The lack of sufficient supply is the cause of the lack of demand, and the lack of demand explains the low interest in waste recycling.

In the case of mutual disinterest of economic agents, the state can act as an arbiter of such relations through administration and encouragement of the organization of relations between demanders and suppliers. Today, an administrative toolkit for government influence on the formation of consumption of secondary raw materials produced from household waste by processing enterprises has been developed in the economy of Ukraine and the countries of the world. Thus, ways to stimulate the demand for secondary raw materials are to establish standards for the use of secondary raw materials in the production of building materials, road surfaces, and glassware and to introduce a special tax regime for the share of products (works, services) produced on the basis of the use of secondary raw materials obtained as a result of household waste recycling.

Therefore, the strategic task of the economy, the solution of which depends on the state of household waste management, is the formation of demand for secondary resources. The regular demand for secondary resources forms the demand for household waste and its processing, which will change the entire system of organizing waste collection and use, and, accordingly, the waste management pricing methods. Changing the concept of the movement of household waste in the process of organizing the treatment methods will ensure the implementation of strategic management tasks. Today, the “pushing” concept of the movement of household waste prevails, according to

which the vast majority of household waste is pushed from the places of its accumulation to the places of its disposal or burial. Stimulating the demand for the use of secondary resources obtained as a result of household waste processing would allow the implementation of a comprehensive concept of the movement of household waste, where the consumer of the secondary resource, while realizing his economic interest, forms a system of incentives for all members of the waste management chain.

In addition, regular demand for secondary resources and prospects for its growth are criteria for the investment attractiveness of household waste processing activities, which enables increasing the share of private investors in the field of waste management.

The effect of the availability of unique resources, their sufficiency and guaranteed stability on the prospects for growth of capital intensity in the field of waste management has been analyzed on the basis of the break-even point analysis, the informative significance of which is related to the possibility of assessing the minimum permissible limits of the waste processing enterprise. Comparing the calculated values of the break-even point with the actual amount of household waste in the specified territory (region, oblast) shows

the sufficiency of waste amount for household waste processing business.

The available household waste has been estimated on the basis of statistical data of the city of Kyiv and Kyiv Oblast, for the purpose of determining the amount of it supply and assessing its adequacy for meeting the demand of processing enterprises. Annually, about 1.2 and 3.49 million t household waste is accumulated in Kyiv and in the Oblast, respectively [15]. So, given the typical structure, the quantitative potential of household waste for obtaining secondary resources in Kyiv and Kyiv Oblast is as follows: 234.5 thousand t construction waste, 469 thousand t paper, 422.1 thousand t polymers, 375 2 thousand t glass, and 9.4 thousand t metals. The potential amount of resources for recycling shall be added with accumulated car tires that are not suitable for disposal in landfills. However, given the rate of recycling and disposal of household waste presented in Table 2, today, in fact, about 295,500 t household waste is sent for recycling annually. Given the generalized structure of waste (Table 4), the amount of recycled polymers is 23.64 thousand t. The similar estimates for other types of household waste have shown that there is a sufficient supply for organizing its processing. However, within the framework of this research, the poten-

Table 5. Capital Investments into Household Waste Recycling and Break-Even Amount of Secondary Resource Production

HHW type	Waste recycling process operations	Average efficiency of facilities	Capital investments, USD thousand	Break-even output, t annually
Waste paper	Collection, transportation, sorting, cleaning, packaging in enlarged packages	0.8 t granules hourly	15–20	100
PET bottles	Sorting, washing, grinding and sifting of crumbs, washing and drying of crumbs, melting, granulation, pressing of briquettes		60–120	115–137
Tires	Grinding, disposal	2 t liquid fuel daily; 1.5 t carbon-containing remains daily; 0.5 t metallic cord annually; 1 t gas daily	130–150	350 (in terms of carbon)

Source: created by the authors based on the data from equipment manufacturers and information of waste recycling companies.

tial supply of household waste for other regions, cities, and towns have not been estimated.

In order to assess the adequacy of household waste supply for loading the production capacity of processing enterprises and to identify the root cause of the low amount of recycled household waste in Ukraine, the capital investment and the break-even amount of secondary resource production, which is formed as a result of the processing of each type of waste, have been estimated (Table 5).

The break-even amount of waste processing is estimated on the basis of the following assumptions: investment in the processing of the corresponding amount of waste is taken at the level of the price of the existing bids for equipment, variable costs are calculated on the basis of the purchase price of the corresponding type of waste from household waste suppliers. The fixed costs are calculated based on the number of employees for equipment maintenance, the existing hourly rates and wages as of the date of calculation, depreciation rates, single social contribution, the tariffs for electricity, water supply, and drainage, and other costs.

The estimates of the break-even amount of secondary products and their corresponding recalculation into the required amount of input resources for processing have shown the sufficient existing offer for the organization of their continuous processing and the sufficient investment attractiveness of the waste management sphere. However, the actual rate of household waste recycling is extremely low, which indicates the lack of regular demand for secondary resources, the lack of economic incentives for the formation of household waste recycling chains, and the lack of highly organized approaches to the formation of resources for recycling.

In order to attract investors to household waste processing, it is necessary to change approaches to the accumulation of waste through its organized collection. Today, increasing the amount of organized waste collection is possible at the expense of household waste in landfills and due to

increasing incentives for the use of secondary resources at enterprises that may consume them.

One of the causes of low investment attractiveness of the waste management sector is unauthorized landfills. It should be noted that all landfills for the placement of waste shall meet the requirements as specified in the Law of Ukraine on Waste.

The register of waste disposal sites is created and maintained in accordance with Resolution of the Cabinet of Ministers of August 3, 1998 No. 1216, on approval of the Procedure for maintaining the register of waste disposal sites by local public administrations, on the basis of issued passports of waste disposal sites.

All household waste disposal facilities that do not meet the above requirements are classified as unauthorized ones. According to the Ministry of Communities and Territories Development, as of 2020, there were 6,000 certified landfills and 22,600 unauthorized landfills in Ukraine.

The lack of strict control over the removal of waste and, as a result, the presence of different tariffs at waste disposal sites lead to an increase in the waste placement in unauthorized places, which, accordingly, reduces the workload of the waste incineration plant in Kyiv and the use of the potential for obtaining secondary resources from household waste.

Thus, according to the *Releine* website, about 1 million t waste paper, 0.6 million t polymers, and 1 million t glass scrap are sent to landfills [16]. At the same time, because of a low percentage of sorted waste in the country, the Ukrainian processing enterprises purchase waste paper, plastic, and glass in order to keep their capacities busy. The amount of waste paper and glass scrap purchased in the EU exceeds 392 thousand t and 32 million t, respectively; the amount of purchased polymers is about 50,000 t [16].

In the conditions of rapid implementation of digital economy, the use of modern means of control over the placement of waste and the activity of landfills ensures an increase in the load of waste sorting lines and waste incineration enterprises,

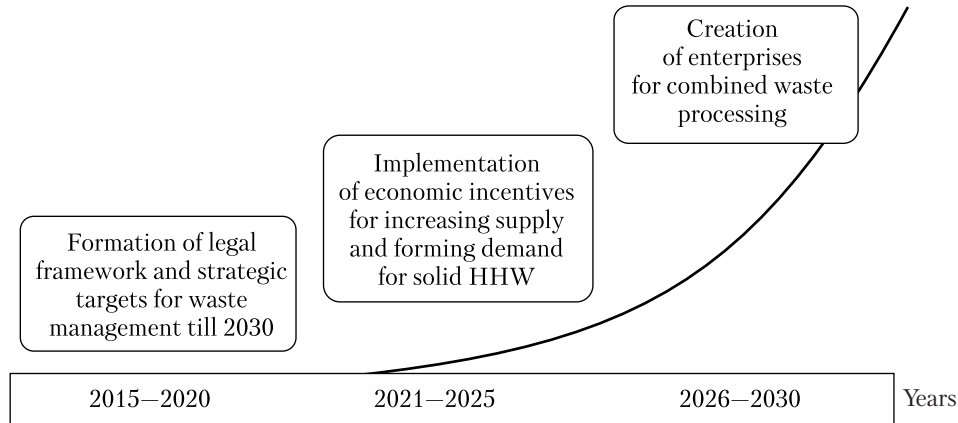


Fig. 2. Stages of strategic household waste management in Ukraine

and, accordingly, the supply of secondary resources to enterprises that demand them. In addition, the environmental tax, as economic regulator that reduces the amount of waste disposal, applies to the placement of waste in specially designated places or objects (landfills). The environmental tax rates are defined in Article 245 of the Internal Revenues Code of Ukraine. Household waste belongs to the 4th class of hazardous waste (except for batteries (the 2nd class of danger), fluorescent lamps (the 1st class of danger), automobile tires (III class of danger), etc.). The environmental tax rate for HHW is UAH 5 per ton. The payer of the environmental tax is the entity that places waste in landfills. Placing waste in unauthorized landfills exempts the subject from the need to pay this tax.

In public information space, as a way to solve problems in the field of household waste management, it has been proposed to increase the environmental tax to the level of European countries. The economic analysis of the environmental tax-to-minimum wage ratio in Ukraine and France has allowed us to draw a conclusion about a difference in the ratios of landfill tariffs to the minimum income of tax payers. So, in 2020, in Ukraine, this ratio was equal to 0.1% (5 UAH/t/5000 UAH), while in France it accounted for 1.2% (20 EUR/t/1554.58 EUR). Having compared the environmental tax rate and the minimum wage in Ukraine and France, we see a low

level of environmental tax in Ukraine. A significant increase in the tariff for waste disposal can lead to an increase in utility payments, and as a result, to an increase in unpaid utility bills. However, low tariffs for waste disposal services do not create incentives for business entities and local authorities to recycle waste. The analysis of the demand for secondary resources obtained from household waste processing and the resulting state of household waste processing has enabled us to conclude that until a regular demand is formed, any increase in the environmental tax leads to a proportional increase in the waste management tariffs for both population and legal entities and to a growth in unpaid utility bills.

An alternative direction of control over the placement of waste in unauthorized places is reporting. Any payment for transport services to waste removal companies shall be based on their reporting on waste placement in authorized sites.

In addition, exercising control over the placement of solid waste in unauthorized places (with the use of a modern video surveillance system) and increasing the fine for waste placement in the places that do not meet the requirements for landfills, as defined in the Law of Ukraine on Waste, will allow increasing the amount of both household waste and its recycling.

The set of proposed tools for economic regulation of household waste management allows for-

ming a balanced system of economic interests of all members of the waste management chain and ensuring long-term development prospects.

On the basis of the set of obtained analytical conclusions and generalizations presented in this research, it can be stated that with the existing economic, organizational, and information components of the household waste management mechanism, it is problematic to achieve the targets of waste processing, as defined in the National Strategy. This conclusion has been confirmed by the implementation of the indicative stability policy supported by the dynamics of the share of recycled and disposed waste in Ukraine. The way out of the relative stagnation in the field of household waste management is to modify the legal framework by introducing new economic and organizational incentives to change the trends household waste management. At this stage, for a breakthrough in household waste management trends we need the formation of economic incentives for the introduction of innovative technologies in waste processing rather than the construction of a new waste processing plant in the city of Lviv. After all, the lack of economic interest is the main cause of the lack of active development of entrepreneurship and the absence of positive dynamics in the amount of household waste processing. The source for the formation of economic interest is a proper balance of supply and demand, prices and costs. In the conditions of imbalance between the specified fundamental components of the economic interest, the state has a set of economic tools for stimulating the development of entrepreneurship in a certain industry. Moreover, the experience of the information technologies development in Ukraine has testified to the capability of government to influence the entrepre-

neurship development trajectory through the introduction of economic stimulation tools.

The household waste management industry requires decisive actions towards the implementation of government incentives for waste processing, which would allow achieving strategic targets of household waste management, given the time lag between the introduction of economic incentives and the consequences of their effect (Fig. 2).

The proposed stages of economic reform in the field of household waste management will ensure achieving the targets, as defined in the National Waste Management Strategy until 2030.

Thus, it can be stated that the household waste management industry in Ukraine has been demonstrating the indicative stability of the structure of waste processing and the absence of dynamic changes. Only 6.3% of generated household waste is recycled or processed in another way, which poses an environmental hazard to the environment, quality of life and health of the population.

Given the existing situation, with the aim of implementing the program documents adopted for the implementation of the Association Agreement between Ukraine and the EU, we have concluded that the government shall influence forming the economic interest of all members of the household waste management chain. It has been proven that the household waste management industry needs support in the form of changing the set of economic tools for waste processing stimulation and revising the organizational approaches to their implementation.

The introduction of economic incentives for household waste processing will ensure the implementation of the targets, as defined in the National Waste Management Strategy until 2030, reduce the polluting load on the ecosystem, and improve the safety and quality of life of the population.

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ЕКОНОМІЧНІ ІНСТРУМЕНТИ СТРАТЕГІЧНОГО УПРАВЛІННЯ ПОБУТОВИМИ ВІДХОДАМИ

Вступ. Необхідність активізації державної політики щодо стимулювання перероблення відходів обумовлена потребою запобігання тим загрозам, які виникають за відсутності екологічної та раціональної системи поводження з відходами.

Проблематика. Україна демонструє низький рівень перероблення побутових відходів, що становить екологічну небезпеку для навколишнього середовища, якості життя та здоров'я населення. Визначені в Національній стратегії управління відходами до 2030 року заходи можуть бути реалізовані лише завдяки поєднанню організації роздільного збирання побутових відходів зі зміною існуючих стимулів, спрямованих на зростання попиту на вторинні ресурси.

Мета. Узагальнення причин низьких обсягів і темпів перероблення побутових відходів, розробка системи економічних інструментів формування пропозиції та попиту на побутові відходи як основних чинників ефективного стратегічного управління відходами.

Матеріали і методи. Використано методи якісного аналізу та узагальнення теоретичного матеріалу, систематизації економічних інструментів управління побутовими відходами, економіко-статистичного аналізу, метод регресійного аналізу.

Результати. Запропоновано комплекс інструментів стратегічного управління побутовими відходами та зміни підходів до їхнього формування. Обґрунтовано, що встановлення тарифу на поводження з відходами має базуватися на довжині ланцюга поводження з відходами, структурі зібраних відходів, потенціалу для їх рециклінгу, зміні методів утворення тарифу, способів організації сортування відходів та зміні суб'єкту оподаткування екологічним податком.

Висновки. Сфера управління побутовими відходами в Україні демонструє певну стабільність структури перероблення відходів та відсутність динамічних змін, які обумовлені змінами у сучасній економіці, проте потребує підтримки, зокрема змін сукупності економічних інструментів стимулювання перероблення відходів та організаційних підходів до їх впровадження.

Ключові слова: побутові відходи, економічні інструменти, поводження з відходами, тарифи на поводження з відходами, витрати на поводження з відходами.